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A POPULAR KEY TO THE DISTINCTIVE GROUPS OF THE LARGER FUNGI.*

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In the writer's courses in Mycology the student is encouraged, so far as it is possible, to determine the names of a number of fungi in each group studied. This procedure has been very unsatisfactory with any of the existing keys. There are, of course, keys and other methods of determining the genera and species of a number of the groups, such as Kauffman's "The Agaricaceæ of Michigan," Overholts' "The Polyporaceæ of the middle-western United States," Coker's "Clavarias of the United States and Canada," and others. There is, however, no easy method of determining the group to which a specimen may belong.

A key to the principal distinctive groups was therefore prepared on the basis of characters which can be readily seen in mature specimens as collected and in terms within the comprehension of the amateur in the study of the fungi. This key has been tested by use with students in the laboratory for three or four years and extensively revised several times as a result.

Although originally prepared for use by classes in Mycology, this key will probably prove helpful to others. There are doubtless many persons who desire to know at least the general group to which the fungi observed during rambles through the woods and fields may belong. This known, it is relatively easy to determine the genus and species, provided the necessary literature is available.

Most of the common fungi of appreciable size can be readily traced, by means of this key, to the proper group. Both the common and scientific names of each group are given, the common name in parenthesis. An effort has been made to

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segregate the distinctive kinds of fungi and, in consequence, the groups listed are of different ranks, including classes, subclasses, orders and families.

The use of microscopic characters is avoided so far as possible. Unfortunately certain fungi, even of relatively large size, can not be distinguished from certain others without study under the microscope. Microscopic characters are frequently added, usually at the end of the paragraph, as a further aid in determination when a microscope is available.

In general the key is built upon the dichotomous plan, that is, the reader, at each step, is given the choice of two sets of opposing or contrasting characters. For the sake of conserving space, however, this plan is not followed throughout, in several places three or more sets of contrasting characters being listed. In each case the paragraphs containing these sets of characters are all given the same number. In tracing a specimen through the key, therefore, all paragraphs bearing the same number should be read and compared with the specimen before a decision is reached.

KEY TO THE GROUPS OF THE LARGER FUNGI.

1. Macroscopic fungi; characterized by the development of fruiting bodies or spore masses whose nature and general structure can be determined without a microscope 2
1. Microscopic fungi; no fruiting bodies of conspicuous size developed (not treated in this key).
   2. Fungus seen as a mass of threads or filaments (which are mostly without cross-walls) 3
   2. Fungus not as above 4
3. Fungi aerial; at first usually white, later tawny to brown or black, usually with many minute brown or black sporangia (Filamentous Black Molds) ..... *Mucorales*
3. Fungi aquatic, always white (Water Molds) ..... *Saprolegniales*
   4. Fruiting structures dusty, powdery or cottony at maturity, with or without an outer membrane 5
   4. Fruiting bodies of compact structure, not dusty or cottony 8
5. Fungi parasitic on green plants 6
5. Fungi saprophytic, growing on the ground or on dead organic material 7
   6. Spore masses or fungous growth white to smoky or violaceous; cottony (with conidiophores) or dusty (at first blister-like). (Downy Mildews and White Blisters) ..... *Peronosporales*
   6. Spore masses black or dark brown; floral organs attacked mostly, sometimes the leaves or stems; spores not stalked (Smuts), *Ustilaginales*
   6. Spore masses yellowish to bright red or reddish-brown, or if black or dark brown, the spores are stalked; leaves and stems mainly attacked (Rusts) ..... *Uredinales*
7. Fruiting bodies aerial, always arising from a mycelium; usually more than one-fourth inch in diameter; usually globose, but sometimes with a thick base or rather slender stalk; stalk never hair-like; all species with a surrounding membrane persistent until maturity; sometimes splitting radially and spreading out in starlike segments; threads (capillitium) without distinct surface markings and never forming a network (Puffballs, Earth-Stars) ..... *Gasteromycetæ*

7. Fruiting bodies (spore masses) aerial, arising from a mycelium, without a membrane, usually forming a flat layer, or if in tufts usually less than one-eighth inch in diameter (Blue and green molds).....*Aspergillaceæ*
7. Fruiting bodies subterranean, arising from a mycelium, with a thick firm membrane (False Truffles).....*Elaphomycetaceæ*
7. Fruiting bodies aerial, never arising from a mycelium; usually less than one-fourth inch in diameter and very numerous; sessile or with a hair-like stalk; surrounding membrane present or absent; capillitium often with spirals, rings, pegs or other markings, sometimes forming a network; if more than one-fourth inch across, fruiting body is either flat or globose; if globose the capillitium has distinct surface markings (Slime Molds).....*Myxomycetæ*
8. Plants grayish-green (some are yellow, olivaceous, brown or black); either circular and leaflike, or erect or pendulous and branched (some form a thin flat crust); papery, leathery or gelatinous in texture; growing on the bark of trees, on stumps, old timbers, rocks, or on the ground; (the plant structure as seen under the microscope consists of fungous elements and green or blue-green algal cells).....(*Lichens*)
8. Plants not grayish-green; fruiting bodies woody, corky or tough-leathery at maturity..... **9**
8. Plants not grayish-green; fruiting bodies fleshy or jelly-like when fresh or wet, sometimes rather tough but not leathery.....**14**
9. Fruiting body rather flat, disklike or irregular in outline, usually black, splitting in more or less radiating lines at maturity (Tar Spot Fungi), *Phacidiales*
9. Fruiting bodies cup- or vase-shaped.....**10**
9. Fruiting bodies not as above.....**11**
10. Fruiting bodies containing egg-like bodies (Birds' Nest Fungi), *Nidulariales*
10. No egg-like bodies present; inner surface of fruiting bodies with microscopic sac-like asci containing spores (Cup Fungi).....*Pezizales*
11. Fruiting body consisting of a minute to rather large, hard or woody structure (stroma), sessile or stalked, with minute dots or pimples (perithecia within); or consisting of single or aggregated more or less spherical perithecia; perithecia containing spores in sac-like asci (Sphere Fungi).....*Pyrenomycetæ*
11. Fruiting body without minute pimples, perithecia and asci; often a stalked cap, or attached to the substratum by the side (shelving), or more or less flat and attached by all or most of the upper surface (resupinate).....**12**
12. Lower surface of cap or fruiting body with teeth, pores, pits or gills (leaflike plates or veinlike ridges).....**13**
12. Lower surface of cap or fruiting body even; without teeth, pores or gills; sometimes erect and branched (Smooth Fungi)..*Thelephoraceæ*
13. With spines or teeth, usually on the lower surface of a cap or fruiting body (Tooth or Spine Fungi).....*Hydnaceæ*
13. With shallow pits, or roundish, angular or elongated tubes or pores, sometimes with thin plates, either labyrinthiform or concentrically arranged on lower surface of cap or fruiting body; often on wood (Woody Pore Fungi).....*Polyporaceæ*
13. With thin or vein-like gills radiating from the stalk or point of attachment on lower surface of cap or fruiting body (Gill Fungi).....*Agaricaceæ*
14. Under surface of cap or fruiting body provided with thin or vein-like radiating plates or gills (Gill Fungi).....*Agaricaceæ*
14. Under surface of cap or fruiting body provided with pores or tubes; usually terrestrial (Fleshy Pore Fungi).....*Boletaceæ*
14. Fruiting body fleshy but not gelatinous, consisting of or bearing numerous teeth or spines (Tooth or Spine Fungi).....*Hydnaceæ*
14. Fruiting body of gelatinous or jelly-like consistency, shelflike, bearing numerous short teeth or spines on the lower surface (Jelly Fungi).....(*Tremellodon*) *Protobasideæ*
14. Fruiting body without gills, teeth or pores.....**15**

15. Plants usually with a strong disagreeable odor when fresh; fruiting body with a distinct sheathing cup at the base, usually stalked, but sometimes a more or less globose lattice-work, or rarely reduced to an egg-like structure which ruptures irregularly at the apex; spore mass greenish, at first firm, later deliquescing, usually borne at the apex of the stalk or on a special cap-like, lattice-like or branched, receptacle; fruiting body one to six inches long (Stinkhorns)..... *Phallales*
15. Plants usually without marked odor; fruiting body stalked or sessile without sheathing cup at base; spore mass not liquified at maturity..... 16
16. Fruiting body disk-, saucer-, cup-, funnel-, or vase-shaped..... 17
16. Fruiting body not as above..... 18
17. Plants always parasitic; cup-like bodies yellow to orange, minute, usually in crowded clusters; spores borne in chains within the cups, usually angular (Rusts)..... *Uredinales*
17. Plants saprophytic, growing on wood, brown, jelly-like (Jew's ear), *Protobasideæ*
17. Plants usually saprophytic, rarely parasitic in this stage; cup-like bodies variously colored; minute to large; spores borne in sac-like asci lining the inner surface of the cup, not angular, (Cup Fungi)..... *Pezizales*
17. Plants saprophytic; cups not in crowded clusters; individual cups usually 1 cm. or more across; (spores borne on the exterior of the cup, not in chains nor in asci) (Smooth Fungi)..... *Thelephoraceæ*
18. Fruiting body gelatinous or jelly-like..... 19
18. Fruiting body fleshy, not jelly-like..... 20
19. Plants parasitic; gelatinous fruit body composed mainly of two-celled spores and their stalks (Rusts)..... *Uredinales*
19. Plants saprophytic, growing on soil; fruiting body green, often slimy, with distinct stalk and cap or head; head covered with a layer of sac-like asci with spores (Leotia)..... *Helvellales*
19. Plants saprophytic, growing on wood; fruiting body without distinct stalk or head; spores not in asci (Jelly Fungi)..... *Protobasideæ*
20. Fruiting body subterranean, globoid..... 21
20. Fruiting body aerial; globoid or with thickened base or with slender stalk; compact within when young, later becoming more or less dusty, often with cottony threads (capillitium); with an outer thin or thick covering (peridium), the outer layer of which sometimes splits radially and spreads out in star-like segments (Puff-balls, Earth Stars)..... *Gasteromycetæ*
20. Fruiting bodies aerial; usually erect, but sometimes without a stalk, not globose..... 22
21. Spores borne in persistent sacs (asci), asci with 1 to 4 rough spores (Truffles)..... *Tuberales*
21. Asci soon disappearing leaving the spores in a more or less dusty mass, (False Truffles)..... *Elaphomycetaceæ*
22. Fruiting body usually bright colored, but sometimes brown or blackish in age, with or without a head; partly covered with minute dots or pimples (perithecia, asci and ascospores within), (Colored Sphere Fungi)..... *Hypocreales*
22. Fruiting body without pimples; stalk-like, tongue-like, spatulate, capitate or pileate, unbranched; upper portion covered with a layer of asci containing spores (Morels, Earth Tongues).. *Helvellales*
22. Fruiting body without pimples and without asci; simple or branched, round in cross section; white, yellow, light brown or some light shade of red or purple (Coral Fungi)..... *Clavariaceæ*
22. Fruiting body without pimples and without asci; simple or branched, usually arising in a cluster; flattened in cross section (Smooth Fungi)..... *Thelephoraceæ*